EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	20146	(q adj2 factor) or (quality adj2 factor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 15:55
L2	51	l1 and (resonant adj2 optical adj2 cavity)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:04
L3	3	l2 and biosensor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 15:56
L4	48	l2 and '10'	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:15
L5	912	resonant adj2 optical adj2 cavity	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:16
L6	22	l5 and whispering adj2 gallery adj2 (mode or modes)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:18
L7	3	l6 and biosensor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:19
L8	0	l5 and photo adj2 recycling	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:19

EAST Search History

L9	0	l5 and 'photo-recycling'	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:20
L10	0	l5 and photorecycling	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:20
L11	2	l5 and (double adj2 resonance)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:21
L12	0	l5 and (mass adj2 sensing)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:21
L13	126	l5 and mass	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:22
L14	2	l13 and analyte	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:26
L15	1	l5 and (contrasting adj2 layer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2006/12/23 16:27

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* * * * * * * * * * * * * * * STN  Columbus  * * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 16:29:20 ON 23 DEC 2006

=> b ca
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                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

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FILE COVERS 1907 - 21 Dec 2006 VOL 146 ISS 1
FILE LAST UPDATED: 21 Dec 2006  (20061221/ED)

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  This file contains CAS Registry Numbers for easy and accurate
  substance identification.


=> s (q(w)factor?) or (quality(w)factor?)
        164644 Q
       1572415 FACTOR?
          1879 Q(W)FACTOR?
        476922 QUALITY
       1572415 FACTOR?
          5843 QUALITY(W)FACTOR?
L1        7507 (Q(W)FACTOR?) OR (QUALITY(W)FACTOR?)

=> s l1 and (resonant(w)optical(w)cavity)
         63493 RESONANT
        820183 OPTICAL
        102081 CAVITY
            60 RESONANT(W)OPTICAL(W)CAVITY
L2           2 L1 AND (RESONANT(W)OPTICAL(W)CAVITY)

=> d ti ab 1-2

L2   ANSWER 1 OF 2  CA  COPYRIGHT 2006 ACS on STN
TI   Resonant optical cavities for high-sensitivity, high-throughput biological
     sensors and methods
AB   Biosensors including resonant optical cavities.  The resonant optical
     cavities are shaped so as to generate whispering gallery modes, which
     increase the   ***quality***     ***factors***   of the cavities and
     facilitate the detection of analytes in a sample with enhanced
     sensitivity.  The sizes of the resonant optical cavities facilitate their
     use in biosensors that include arrays of sensing zones.  Accordingly, the
     resonant optical cavities may be used in high-d. sensing arrays that can
     be read in real-time and in parallel.  Thus, the resonant optical cavities
     are useful for detecting small concns. of samples in real-time and with
     high throughput.  Different embodiments of the biosensors are also
     disclosed, as are methods for using the biosensors.

L2   ANSWER 2 OF 2  CA  COPYRIGHT 2006 ACS on STN
TI   Thermal modeling in cavity-enhanced photothermal spectroscopy
AB   The   ***quality***  -  ***factor***   dependent enhancement of the field
```

of a weak probe laser beam inside a ***resonant*** ***optical*** ***cavity*** is used to measure the minute optical absorption of liq. films, metallic and high reflectivity dielec. coatings. The measurement is not affected by the presence of the surface reflections and the scattering from the strong pump laser beam, which is focussed onto the sample placed inside the cavity. Laser surface heating calcns. were performed and account qual. for both the spatial and temporal behavior of the obsd. signals.

=> d all 1

L2 ANSWER 1 OF 2 CA COPYRIGHT 2006 ACS on STN
AN 135:16337 CA <<LOGINID::20061223>>
ED Entered STN: 28 Jun 2001
TI Resonant optical cavities for high-sensitivity, high-throughput biological sensors and methods
IN Blair, Steven M.
PA University of Utah Research Foundation, USA
SO PCT Int. Appl., 44 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM G01N
CC 9-1 (Biochemical Methods)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001040757	A2	20010607	WO 2000-US41138	20001012
	WO 2001040757	A3	20020314		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	CA 2384977	A1	20010607	CA 2000-2384977	20001012
	AU 2001045032	A5	20010612	AU 2001-45032	20001012
	EP 1221051	A2	20020710	EP 2000-992472	20001012

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2003515737	T	20030507	JP 2001-542173	20001012
PRAI	US 1999-159366P	P	19991014		
	WO 2000-US41138	W	20001012		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2001040757	ICM	G01N
	IPCI	G01N [ICM,7]
	IPCR	G01N0021-25 [I,C*]; G01N0021-25 [I,A]; G01N0021-27 [I,A]; G01N0021-55 [I,C*]; G01N0021-55 [I,A]; G01N0021-64 [I,C*]; G01N0021-64 [I,A]; G01N0033-543 [I,C*]; G01N0033-543 [I,A]; G01N0033-566 [I,C*]; G01N0033-566 [I,A]; G01N0037-00 [I,C*]; G01N0037-00 [I,A]
	ECLA	G01N021/25B2; G01N021/55B; G01N021/64H
CA 2384977	IPCI	G01N0033-543 [ICM,7]
	IPCR	G01N0021-25 [I,C*]; G01N0021-25 [I,A]; G01N0021-27 [I,A]; G01N0021-55 [I,C*]; G01N0021-55 [I,A]; G01N0021-64 [I,C*]; G01N0021-64 [I,A]; G01N0033-543 [I,C*]; G01N0033-543 [I,A]; G01N0033-566 [I,C*]; G01N0033-566 [I,A]; G01N0037-00 [I,C*]; G01N0037-00 [I,A]
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AU 2001045032	IPCR	G01N0021-25 [I,C*]; G01N0021-25 [I,A]; G01N0021-27 [I,A]; G01N0021-55 [I,C*]; G01N0021-55 [I,A]; G01N0021-64 [I,C*]; G01N0021-64 [I,A]; G01N0033-543 [I,C*]; G01N0033-543 [I,A]; G01N0033-566 [I,C*]; G01N0033-566 [I,A]; G01N0037-00 [I,C*]; G01N0037-00

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                        [I,A]
                 ECLA   G01N021/25B2; G01N021/55B; G01N021/64H
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                        [I,A]; G01N0021-55 [I,C*]; G01N0021-55 [I,A];
                        G01N0021-64 [I,C*]; G01N0021-64 [I,A]; G01N0033-543
                        [I,C*]; G01N0033-543 [I,A]; G01N0033-566 [I,C*];
                        G01N0033-566 [I,A]; G01N0037-00 [I,C*]; G01N0037-00
                        [I,A]
                 ECLA   G01N021/25B2; G01N021/55B; G01N021/64H
 JP 2003515737   IPCI   G01N0021-27 [ICM,7]; G01N0021-25 [ICM,7,C*];
                        G01N0021-64 [ICS,7]; G01N0033-543 [ICS,7]; G01N0033-566
                        [ICS,7]; G01N0037-00 [ICS,7]
                 IPCR   G01N0021-25 [I,A]; G01N0021-25 [I,C*]; G01N0021-55
                        [I,A]; G01N0021-55 [I,C*]; G01N0021-64 [I,A];
                        G01N0021-64 [I,C*]
AB   Biosensors including resonant optical cavities.  The resonant optical
     cavities are shaped so as to generate whispering gallery modes, which
     increase the   ***quality***    ***factors***   of the cavities and
     facilitate the detection of analytes in a sample with enhanced
     sensitivity.  The sizes of the resonant optical cavities facilitate their
     use in biosensors that include arrays of sensing zones.  Accordingly, the
     resonant optical cavities may be used in high-d. sensing arrays that can
     be read in real-time and in parallel.  Thus, the resonant optical cavities
     are useful for detecting small concns. of samples in real-time and with
     high throughput.  Different embodiments of the biosensors are also
     disclosed, as are methods for using the biosensors.
ST     ***resonant***     ***optical***     ***cavity***   high throughput biol
     sensor
IT   Interface
        (Planar; resonant optical cavities for high-sensitivity,
        high-throughput biol. sensors and methods)
IT   Biosensors
     Concentration (condition)
     Electromagnetic wave
     Fluorescence
     Fluorescent probes
     Immobilization, biochemical
     Mass
     Molecules
     Optical waveguides
     Refractive index
     Samples
     Semiconductor materials
     Waveguides
        (resonant optical cavities for high-sensitivity, high-throughput biol.
        sensors and methods)
IT   Glass, uses
     RL: DEV (Device component use); USES (Uses)
        (resonant optical cavities for high-sensitivity, high-throughput biol.
        sensors and methods)
IT   146368-15-2
     RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
        (resonant optical cavities for high-sensitivity, high-throughput biol.
        sensors and methods)
IT   7631-86-9, Silica, uses   11105-01-4, Silicon oxynitride   14808-60-7,
     Quartz, uses   17341-25-2, Sodium ion, uses   24203-36-9, Potassium ion,
     uses
     RL: DEV (Device component use); USES (Uses)
        (resonant optical cavities for high-sensitivity, high-throughput biol.
        sensors and methods)


=> d his

     (FILE 'HOME' ENTERED AT 16:29:20 ON 23 DEC 2006)

     FILE 'CA' ENTERED AT 16:29:37 ON 23 DEC 2006
L1          7507 S (Q(W)FACTOR?) OR (QUALITY(W)FACTOR?)
L2             2 S L1 AND (RESONANT(W)OPTICAL(W)CAVITY)

=> l1 and (optical(w)cavity)
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L1 IS NOT A RECOGNIZED COMMAND
The previous command name entered was not recognized by the system.
For a list of commands available to you in the current file, enter
"HELP COMMANDS" at an arrow prompt (=>).

=> s l1 and (optical(w)cavity)
        820183 OPTICAL
        102081 CAVITY
          2114 OPTICAL(W)CAVITY
L3          30 L1 AND (OPTICAL(W)CAVITY)

=> s l3 not l2
L4          28 L3 NOT L2

=> d ti ab 1-28
```

L4 ANSWER 1 OF 28 CA

TI Self-cooling of a micro-mirror by radiation pressure

AB We demonstrate passive feedback cooling of a mech. resonator based on radiation pressure forces and assisted by photothermal forces in a high-finesse ***optical*** ***cavity*** . The resonator is a free-standing high-reflectance micro-mirror (of mass m .apprxeq. 400 ng and mech. ***quality*** ***factor*** Q .apprxeq. 104) that is used as back-mirror in a detuned Fabry-Perot cavity of optical finesse F .apprxeq. 500. We observe an increased damping in the dynamics of the mech. oscillator by a factor of 30 and a corresponding cooling of the oscillator modes below 10 K starting from room temp. This effect is an important ingredient for recently proposed schemes to prep. quantum entanglement of macroscopic mech. oscillators.

L4 ANSWER 2 OF 28 CA

TI Chemical and biological sensing through optical resonances in pendant droplets

AB A microdroplet can act as a high ***quality*** ***factor*** ***optical*** ***cavity*** that supports Morphol. Dependent Resonances(MDRs). Enhanced radiative energy transfer through these optical resonances can also be utilized as a transduction mechanism for chem. and biol. sensing. Enhancement in radiative energy transfer is obsd. when a donor/acceptor pair is present in the resonant medium of a microcavity. Here, we demonstrate avidin-biotin binding and its detection through a FRET pair as a potential application for ultra-sensitive detection for fluoroimmunoassays. The binding interaction between the biotinylated donor mols. and streptavidin-acceptor conjugate was used to observe the energy transfer between the dye pairs. The radial modes of MDRs extend to approx. 0.6 r0 inside the droplet. As a result, the fluorescent emission around the center is not coupled to the optical resonances losing sensitivity. To address this problem, we prepd. water-in-oil emulsions of avidin and biotin contg. solns. The water phase contains the streptavidin-Alexa Fluor 610 and the oil phase contains biotinylated fluorescent bead. Streptavidin-biotin binding reaction occurs at the water-oil interface. The water phase accumulates at the droplet air interface due to higher specific d. enhancing the resonance coupling. Water and oil phase are index-matched to avoid scattering problems. As a result, a large portion of the avidin-biotin complex was localized at the pendant droplet and air interface. Strong coupling of acceptor emission into optical resonances shows that the energy transfer is efficiently mediated through these resonances.

L4 ANSWER 3 OF 28 CA

TI Integrated all-optical switch in a cross-waveguide geometry

AB An all-optical switch for future computer optical interconnect systems based on an ***optical*** ***cavity*** with a high ***quality*** ***factor*** and a nonlinear material is computationally investigated in two dimensional with a finite-difference time domain method. The signal and control bus are perpendicular to each other and can couple into a high-Q cavity consisting of a nonlinear material. It is designed in such a way that the control bus switches the signal bus on and off. Owing to the nonlinearity in the cavity, the resonance is shifted in frequency when increasing the power in the control bus so that the signal can pass through the resonator. The high Q of the cavity maximizes the interaction with the nonlinear material, and the symmetry of the cavity mode is designed in such a way that the cross talk between the signal bus and the control bus is minimized.

L4 ANSWER 4 OF 28 CA COPYRIGHT 2006 ACS on STN
TI The detection of carbon monoxide by cavity enhanced absorption spectroscopy with a DFB diode laser
AB Cavity enhanced absorption spectroscopy is a high sensitive spectral technique. The aim of our study was to apply this spectral technique to the detection of CO with a narrow line width tunable DFB diode laser and high ***Q*** ***factor*** ***optical*** ***cavity*** . Absorption signals were extd. from a measurement recording the av. of 20 highest light intensities that leak out of the cavity. The absorption spectrum of CO centered at 6354.18 cm-1 was recorded; the expt. results indicate that cavity enhanced absorption spectroscopy could produce accurate high resoln. spectrum. A detection sensitivity about 5.687 .times. 10-7 cm-1 was achieved in a 45 cm-long cell.

L4 ANSWER 5 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Ultrafast all-optical switching: photonic engineering of resonator structures with organic nonlinear Kerr materials
AB A laterally structured all-optical switch based on an ***optical*** ***cavity*** with high ***quality*** ***factor*** and an org. nonlinear Kerr material is investigated theor. Owing to the non-linearity in the cavity, the resonance shifts in frequency on increase of the pump power, leading to either transmission or blocking of the signal beam. Furthermore, we report ultrafast pump & probe measurements of hybrid 1-D photonic bandgap structures consisting of an inorg. microcavity with an org. Kerr material. By varying the pump beam wavelength across the cavity resonance, we are able to distinguish between the underlying nonlinear absorption and the dispersion necessary for all-optical switching. It turns out that in the spectral region between 780 and 880 nm the nonlinear absorption dominates the signal.

L4 ANSWER 6 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Low-loss photonic wires and compact ring resonators in silicon-on-insulator
AB We fabricated single-mode photonic wires, nanophotonic waveguides confining light by total internal reflection. The structures are defined in silicon-on-insulator using 248nm deep UV lithog., a widely adopted technol. for CMOS applications. The cryst. silicon core has a thickness of 220nm and a width of up to 600nm. A 1.mu.m thick silica layer serves as the lower cladding. We measured the loss of straight waveguides using the Fabry-Perot interference spectrum of the cleaved samples. A 500nm wide waveguide has a loss as low as 2.4dB/cm at 1550nm wavelength. We measured 90.degree. bends to have excess losses of about 1dB. Mirror bends perform comparably. We fabricated sym. coupled ring and "racetrack" resonators with small radius. ***Q*** - ***factors*** higher than 3000 are achieved, leading to low add-drop crosstalk, high finesse and low at-resonance insertion loss. By fitting the theor. model to the exptl. results, we extd. parameters such as the coupling ratio, cavity loss and group index. We analyzed the fabrication tolerances allowed for these resonators to be suitable as a building block for WDM filtering components. The allowed deviation on the waveguide widths and gaps for the coupling ratio to be within specification are within the possibilities of the fabrication method. However, a method to tightly control the ***optical*** ***cavity*** length is needed as the ring's group index is highly dependent on waveguide width.

L4 ANSWER 7 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Tunable optical filters for in-plane integration on InP MEMS platform
AB We have demonstrated a planar waveguide-based tunable integrated optical filter in indium phosphide (InP) with on-chip micro-electro-mech. (MEMS) actuation. An air-gap Fabry-Perot resonant microcavity is formed between two waveguides, whose facets have monolithically integrated high-reflectivity multilayer InP/air Distributed Bragg Reflector (DBR) mirrors. A suspended beam electrostatic microactuator attached to one of the DBR mirrors modulates the microcavity length, resulting in a tunable filter. The DBR mirrors provide a broad high-reflectivity spectrum, within which the transmission wavelength can be tuned. The in-plane configuration of the filter enables easy integration with other active and passive waveguide-based optoelectronic devices on a chip and simplifies fiber alignment. Exptl. results from the first generation of tunable optical filters are presented. The microfabricated filter exhibited a

resonant wavelength shift of 12nm (1513-1525nm) at a low operating voltage of 7V. A full-width-half-max. (FWHM) of 33 nm was exptl. obsd., and the ***quality*** ***factor*** was calcd. to be 46. Several improvements of the MEMS actuator, waveguide, and ***optical*** ***cavity*** design for the future devices are discussed.

L4 ANSWER 8 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Optical study of spatially ordered InAs quantum dots in disk-like structures
AB InAs quantum dots (QD) made by self-assembled growth naturally have a random spatial and large spectral distribution. However the spatial and spectral profile of an ***optical*** ***cavity*** mode are highly predictable. To achieve the max. interaction of single QD spontaneous emission (SE) with a cavity mode, QDs should ideally be spatially located in the cavity mode, but well isolated from nearby nonradiative surface recombination. To solve this issue, we have developed a patterned regrowth technique to place QDs near the antinode of a cavity mode. We show that the regrowth process does not affect the QDs optical properties while maintaining reasonable cavity ***quality*** ***factors*** . The PL signature of our QDs is discussed. We identify the single excitons, charged excitons and bi-excitions. Their relative intensities are decided by the excessive energy of free carriers and tunable by the sample temp. In our research, we see strong evidence of disk sizing effect, which provide addnl. method to control the QD d. besides material deposition and growth temp. With this addnl. tunability, the QD d. can be adjusted to produce low nos. of QDs (1.apprx.3 dots) per disk, so the optimal coupling of a single QD with a single cavity mode is quite plausible.

L4 ANSWER 9 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Robust scheme for the generation of entangled states for N atoms in a cavity
AB A scheme is proposed for the generation of W entangled states for several atoms trapped in a cavity by detecting photon decay. The scheme works in the regime, where the cavity decay rate is larger than the atom-cavity coupling strength. Thus, the requirement for the ***quality*** ***factor*** of the cavity is greatly loosened, which is of importance in view of expt. Another advantage of this scheme is that the atoms are always populated in two ground states coupled by Raman transitions, thus the spontaneous emission can also be suppressed.

L4 ANSWER 10 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Beam quality of semiconductor laser cascaded by tunnel junction
AB Based on the theory of waveguide mode and the theory of non-paraxial vectorial moment, the beam quality of TE0 mode propagating in InGaAs/GaAs/AlGaAs semiconductor laser cascaded by tunnel junction is studied. The relation between the inner cladding layer's thickness and the ***quality*** ***factor*** of vertical beam is analyzed. The results show that the tunnel junction should not only regenerate the carriers to improve slope efficiency but also widen ***optical*** ***cavity*** to diminish M2 and vertical divergence angle. Fabricated is a novel device with 271A/cm2 of threshold c.d., 1.49W/A of slope efficiency, 17.4 degree of vertical divergence angle and 1.11 of beam ***quality*** ***factor*** .

L4 ANSWER 11 OF 28 CA COPYRIGHT 2006 ACS on STN
TI VCSEL
AB A vertical cavity surface-emitting semiconductor laser (VCSEL) with a triangular or truncated triangular prism ***optical*** ***cavity*** resonator based on III-V and II-VI semiconductor compds. and their alloys is disclosed. The use of a triangular or truncated triangular prism ***optical*** ***cavity*** resonator with a high ***quality*** ***factor*** for vertical and lateral confinement of light allows both the advantages of usual VCSELs and lateral cavity triangular lasers. In an alternative embodiment a lateral emission can be redirected vertically by a mirror or grating.

L4 ANSWER 12 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Free-standing porous silicon single and multiple optical cavities
AB Porous Si free-standing microcavity structures, with different layer designs, were fabricated. Single microcavities show transmission resonances in the technol. relevant .lambda. .apprxeq. 1.55 .mu.m with

quality ***factors*** .ltoreq.3380. High-order cavities show sub-nm transmission peaks over the whole stop band. Coupled microcavity structures, where splitting of the degenerate cavity mode occurs, lead to multiple transmission peaks in a limited region of the stop band. Incident angle-dependent measurements are reported, where transmission peak blueshift and splitting of transverse elec. and transverse magnetic polarized modes due to porous Si birefringence were obsd.

L4 ANSWER 13 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Photonic crystal microcavities for strong coupling between an atom and the cavity field and method of fabricating the same
AB Optical app. is described which comprises an array of holes in a photonic crystal; and a defect in the array of holes created by elongation of the holes in the array in a predetd. direction to define an asym. ***optical*** ***cavity*** with a ***Q*** ***factor*** >2000. The app. can be incorporated in waveguides and lasers. They can also be used for strong coupling between the cavity field and an atom trapped within a defect of the photonic crystals, or for tunable filters if the holes are filled with electrooptical polymers. Modal structures of microcavities, as well as ***quality*** ***factors*** , mode vols., symmetry properties and radiation patterns of localized defect modes as a function of the slab thickness and parameters of photonic crystal and defects are illustrated. Methods for fabricating the app. entailing defining the array of holes and disposing the crystal above a substrate and sepd. from it by an air gap are also described.

L4 ANSWER 14 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Optical resonances with high ***quality*** ***factors*** observed in II-VI semiconductor pyramidal photonic dots
AB ***Optical*** ***cavity*** properties and luminescence properties of ZnS-based photonic dots were studied. One ZnS optical wavelength-sized photonic dot showed optical resonances with a ***quality*** ***factor*** >3000. The luminescence from the ZnS photonic dots with CdS active layers embedded inside the photonic dots showed modulation of the spontaneous emission measured at room temp.

L4 ANSWER 15 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Beam quality of high power 800 nm broad-area laser diodes with 1 and 2 .mu.m large ***optical*** ***cavity*** structures
AB The beam quality of 800 nm AlGaAs/GaAsP broad-area (BA) laser diodes with large ***optical*** ***cavity*** (LOC) waveguide structures was studied under high power conditions. The LOC structures consist of a tensile-strained GaAsP single quantum well embedded in AlGaAs layers forming 1 and 2 .mu.m thick waveguide cores. A low beam divergence of 51.degree. resp. 46.degree. (full width at 1/e2 max.) is obtained in fast axis direction. BA diode lasers with 2 mm cavity length and stripe widths of 60, 100 and 200 .mu.m show beam ***quality*** ***factors*** M2 along the slow axis of .apprx.12, 16 and 35 at 2 W output power, resp. M2 also weakly depends upon the waveguide width and is slightly smaller for the 2 .mu.m waveguide core if the stripe width is <100 .mu.m.

L4 ANSWER 16 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Cavity ring-down spectroscopy: experimental schemes and applications
AB A review with 100s refs. Cavity ring-down (CRD) spectroscopy is a direct absorption technique, which can be performed with pulsed or continuous light sources and has a significantly higher sensitivity than obtainable in conventional absorption spectroscopy. The CRD technique is based upon the measurement of the rate of absorption rather than the magnitude of absorption of a light pulse confined in a closed ***optical*** ***cavity*** with a high ***Q*** ***factor*** . The advantage over normal absorption spectroscopy results from, firstly, the intrinsic insensitivity to light source intensity fluctuations and, secondly, the extremely long effective path lengths (many kilometres) that can be realized in stable optical cavities. In the last decade, the CRD technique is esp. powerful in gas-phase spectroscopy for measurements of either strong absorptions of species present in trace amts. or weak absorptions of abundant species. In this review, the authors emphasize the various exptl. schemes of CRD spectroscopy, and these schemes can be used to obtain spectroscopic information on atoms, mols., ions and clusters in many environments such as open air, static gas cells, supersonic expansions, flames and discharges.

L4 ANSWER 17 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Preparation of homogeneous microspheres for ***optical*** ***cavity***
AB Using phenyltriethoxysilane (PTES) as a starting material, prepn. of pore-free org.-inorg. hybrid spheres of micrometer sizes have been investigated for their application to optical cavities. Undesirable imperfections such as inside pores which scatter light decrease the ***quality*** ***factor*** (Q value) of a sphere. Centrifugation technique using potassium tartrate aq. soln. as a d.-changing solvent from 1.0 to 1.4 was developed to sep. pore-free particles from as-prepd. particles. The percentage of pore-free particles was estd. about 5% of the wt. of as-prepd. samples. The size distribution of pptd. particles in various d. solvents was estd. by SEM. Larger d., pore-free particles had a smaller size compared with those of low d., pore-contg. spheres.

L4 ANSWER 18 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Operating characteristics of GaAs-InGaAs self-biased piezoelectric S-SEEDs
AB A theor. anal. is presented of the performance of GaAs-InxGa1-xAs self-biased piezoelec. sym. self-electrooptic-effect devices (S-SEED). Although the operation of these devices was demonstrated, the limitations on their performance were not studied. Despite the benefits assocd. with this type of S-SEED, the model presented suggests that their insertion loss cannot be .ltorsim.70%. Further, because of the high ***quality*** ***factor*** required for the ***optical*** ***cavity*** , it is believed that the reproducibility of the contrast ratio will be intolerant to differences between the nominal and actual absorption coeffs. The model therefore suggests that these structures are not promising candidates for the logical elements required in optical processing.

L4 ANSWER 19 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Generation of photons in a lossy and detuned cavity with an oscillating boundary
AB A possibility of creating photons from vacuum due to the nonstationary Casimir effect in a weakly damped nondegenerate cavity with vibrating boundaries is analyzed in the case of a nonzero detuning from the exact resonance. The photon generation is possible provided that the relative detuning and inverse ***quality*** ***factor*** do not exceed the crit. value of the order of 10-8. Under this condition, the field goes finally to a highly squeezed quantum state.

L4 ANSWER 20 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Laser diagnostics for droplet characterization: Application of morphology dependent resonances
AB A review with 154 refs. A micron-sized liq. droplet acts as a very high- ***quality*** ***factor*** ***optical*** ***cavity*** . The cavity modes are referred to as morphol.-dependent resonances (MDRs), which are sensitive to the droplet size, shape, and inclusions. The MDRs greatly lower the input intensity needed to generate detectable amts. of linear and nonlinear optical radiation and exhibit sharp peaks in the spectra of elastic scattering, fluorescence, lasing, and stimulated Raman scattering. Novel spectroscopic-based techniques are now available for droplet diagnostics of its phys., chem., and thermal properties. In particular, MDR-related spectroscopy is reviewed for detg. droplet size, shape, evapn. rate, surface tension, viscosity, near-surface temp., species, and species concn. in multicomponent droplets.

L4 ANSWER 21 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Effect of bubble formation on microdroplet cavity ***quality*** ***factors***
AB ***Optical*** ***cavity*** ***quality*** ***factors*** (Q's) of EtOH microdroplets with internal bubbles were estd. from cavity mode emission efficiencies as a function of the dissolved gas content. Droplets were generated with a vibrating orifice aerosol generator driven by pressurized gas. With He- or N-gas pressurization, Q's were .apprx.2 .times. 108, a value expected to be near a practical upper limit for this size of cavity. Surface capillary waves with a root-mean-square amplitude of 1.4 nm are conjectured to limit Q values under these conditions. However, two regimes dominated by bubbles were obsd. when CO2-gas pressurization was used. In one regime, nominal 10.25-.mu.m-radius hollow droplets, consisting of a concentric outer EtOH layer surrounding a 7.75-.mu.m-radius gaseous central core, were formed when the vibrating orifice frequency was tuned to a particular value. These hollow sphere

droplets displayed a higher Q of 4 .times. 108, a value that is consistent with the increase in outer radius. In the 2nd regime, at higher vibrating orifice frequencies, smaller homogeneous microdroplets were formed. The authors conjecture that these microdroplets contain a dispersion of submicrometer-sized bubbles, leading to nonnegligible internal elastic scattering losses and reducing the highest observable Q values to .gtoreq.3 .times. 105. Sound waves assocd. with the vibrating orifice must also contribute to the bubble formation because these effects were frequency dependent.

L4 ANSWER 22 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Optical scattering as a probe of a local field effect in micron-sized CdS spheres
AB The optical properties of individual 3- to 14-.mu. diam. CdS cryst. spheres embedded in poly(Me methacrylate) were studied using elastic scattering. The presence of well defined sharp peaks in the 550 to 600 nm elastic scattering spectra confirmed that each microcrystal acts as an ***optical*** ***cavity*** with cavity ***quality*** ***factors*** exceeding 104. Such natural resonator microcrystals should lead to greatly enhanced local field effects near the surface of CdS, quantum electrodynamic modification of optical transition rates of nearby species and altered photochem. Absorptive heating following high intensity laser irradn. was found to induce a transient washout of the high Q modes.

L4 ANSWER 23 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Theory of a short ***optical*** ***cavity*** with dielectric multilayer film mirrors
AB A theory for a 1-dimensional ***optical*** ***cavity*** with multilayer dielec. film mirrors was developed by the matrix method, where normalized orthogonal mode functions with a continuous spectrum were derived both inside and outside the cavity, and the field is quantized with them. The theory provides an exact means to study the mode characteristics of, and hence the spontaneous emission in a short ***optical*** ***cavity*** with mirrors of finite thickness. On the basis of this theory, a short ***optical*** ***cavity*** was examd. with a length of half-wavelength and mirrors of quarter-wavelength single-layer dielec. film. The result shows that the resonant frequency is slightly different from that in a cavity of the same cavity length and the same mirror reflectivity but with 2 .delta.-function like mirrors, furthermore, with the derived mode functions the spontaneous emission from a 2-level atom in such a cavity was analyzed under a perturbation approxn., and the results shows that the spontaneous emission in the cavity is enhanced by the cavity ***quality*** ***factor*** Q when the atom is at the antinode and is inhibited by the factor 1/Q when the atom is at the node.

L4 ANSWER 24 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Study of intracavity absorption and laser behavior for ethylene, ethane, fluoromathane, chloromethane, and methane/nitrogen by photoacoustic resonance spectroscopy
AB The first radial mode of a cylindrical resonator was excited in extracavity and intracavity configurations employing a modulated 3.39 .mu.m He-Ne laser. The resonance curves were measured as a function of pressure by a computer-controlled method and fitted to Lorentzian profiles. Measurements were performed for C2H4, CH3Cl, CH3F, C2H6, and CH4, where the optical absorption coeff. detd. by transmission expts. increases from C2H4 to CH4. From the signal strengths and the ***Q*** ***factors*** of the resonances the so-called photoacoustic signal (PAS) was detd. and compared with theory. Good agreement between theory and expt. was obsd. for all extracavity measurements and in the case of intracavity expts. with low optical losses in the laser resonator. In order to describe the large discrepancies between the exptl. detd. PAS and the existing theory for high losses, improved models were developed, which are based on an inhomogeneous distribution of laser power in the ***optical*** ***cavity*** . Deviations from these models were found near threshold. The PAS obsd. above threshold is attributed to amplified spontaneous emission.

L4 ANSWER 25 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Photon lifetime within a droplet: temporal determination of elastic and stimulated Raman scattering

AB Time profiles of the elastically scattered and stimulated Raman scattered radiation from single EtOH droplets illuminated by 100-ps mode-locked pulses were measured with a streak camera. The ***Q*** ***factor*** of the droplet, which acts as an ***optical*** ***cavity*** , was deduced from the decay time of the internally trapped radiation. Based on the intensity dependence of time profiles, it is also deduced that the photon lifetime is limited by the depletion of the internal intensity in generating nonlinear-optical radiation.

L4 ANSWER 26 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Electromagnetic decay into a narrow resonance in an ***optical*** ***cavity***
AB The spontaneous electromagnetic decay of a 2-level atom coupled to a narrow cavity resonance was investigated rigorously in terms of the (Hermitian) modes of the universe rather than the (dissipative) quasimodes of the cavity. Special attention was paid to the strong-coupling regime (at. linewidth .GAMMA. .gtorsim. cavity resonance width .gamma.), in which there are corrections to the golden rule. Spontaneous decay is most rapid for intermediate values of the ***quality*** ***factor*** Q of the cavity resonance. The photon line shape, the effect of several cavity resonances, and the competition of several transitions were investigated. The additivity of partial rates did not hold, and in some circumstances, the addn. of an extra decay channel reduced the total decay rate. These results are relevant to optical processes obsd. in dielec. microspheres, and to usual laser cavities.

L4 ANSWER 27 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Effect of inductive couplings on the dispersion properties of a four-chamber ***optical*** ***cavity*** for the linear proton accelerator
AB The influence was studied of nonresonant inductive coupling contours on the dispersion characteristics and the tuning of the ***optical*** ***cavity*** . The use in a 4-chamber H- ***optical*** ***cavity*** of such contours sharply decreases the ***quality*** ***factor*** of the ***optical*** ***cavity*** in dipolar modes, but does not change its radiotech. parameters in the operating mode, which allows one to simply the procedure and to improve the quality of the tuning of the multisection ***optical*** ***cavity*** in a given field distribution. The H/ ***optical*** ***cavity*** , which is excited in the H211 working mode, is used in a linear p accelerator with spatially homogeneous quadrupole focusing.

L4 ANSWER 28 OF 28 CA COPYRIGHT 2006 ACS on STN
TI Waveguide gas laser
AB The waveguide gas laser contains a waveguide discharge tube filled with a working medium, ***optical*** ***cavity*** , and an intracavity selector of lasing lines. The emissive power is increased on a lasing line by improving the ***quality*** ***factor*** of the cavity by making the selector of lasing lines as a layer of a selective material applied to the entire area of the inner surface of the waveguide discharge tube. A condition is given for the thickness of the layer of selective material.

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=> d his

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     FILE 'CA' ENTERED AT 16:29:37 ON 23 DEC 2006
L1         7507 S (Q(W)FACTOR?) OR (QUALITY(W)FACTOR?)
L2            2 S L1 AND (RESONANT(W)OPTICAL(W)CAVITY)
L3           30 S L1 AND (OPTICAL(W)CAVITY)
L4           28 S L3 NOT L2

=> s resonant optical cavit?
        63493 RESONANT
       820183 OPTICAL
       135011 CAVIT?
L5           66 RESONANT OPTICAL CAVIT?
                  (RESONANT(W)OPTICAL(W)CAVIT?)

=> l5 and whispering gallery mode?
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L5 IS NOT A RECOGNIZED COMMAND
The previous command name entered was not recognized by the system.
For a list of commands available to you in the current file, enter
"HELP COMMANDS" at an arrow prompt (=>).

=> s l5 and whispering gallery mode?
           663 WHISPERING
          2004 GALLERY
       2700411 MODE?
           558 WHISPERING GALLERY MODE?
                 (WHISPERING(W)GALLERY(W)MODE?)
L6           1 L5 AND WHISPERING GALLERY MODE?

=> d ti ab

L6   ANSWER 1 OF 1  CA  COPYRIGHT 2006 ACS on STN
TI     ***Resonant***     ***optical***     ***cavities***   for
     high-sensitivity, high-throughput biological sensors and methods
AB   Biosensors including   ***resonant***     ***optical***     ***cavities***
     .  The   ***resonant***     ***optical***     ***cavities***   are shaped
     so as to generate   ***whispering***     ***gallery***     ***modes***   ,
     which increase the quality factors of the cavities and facilitate the
     detection of analytes in a sample with enhanced sensitivity.  The sizes of
     the   ***resonant***     ***optical***     ***cavities***   facilitate
     their use in biosensors that include arrays of sensing zones.
     Accordingly, the   ***resonant***     ***optical***     ***cavities***
     may be used in high-d. sensing arrays that can be read in real-time and in
     parallel.  Thus, the   ***resonant***     ***optical***     ***cavities***
     are useful for detecting small concns. of samples in real-time and with
     high throughput.  Different embodiments of the biosensors are also
     disclosed, as are methods for using the biosensors.


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     (FILE 'HOME' ENTERED AT 16:29:20 ON 23 DEC 2006)

     FILE 'CA' ENTERED AT 16:29:37 ON 23 DEC 2006
L1        7507 S (Q(W)FACTOR?) OR (QUALITY(W)FACTOR?)
L2           2 S L1 AND (RESONANT(W)OPTICAL(W)CAVITY)
L3          30 S L1 AND (OPTICAL(W)CAVITY)
L4          28 S L3 NOT L2
L5          66 S RESONANT OPTICAL CAVIT?
L6           1 S L5 AND WHISPERING GALLERY MODE?

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COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                           ENTRY    SESSION
FULL ESTIMATED COST                                       100.31     100.52

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)            SINCE FILE      TOTAL
                                                           ENTRY    SESSION
CA SUBSCRIBER PRICE                                       -22.72     -22.72

STN INTERNATIONAL LOGOFF AT 16:46:55 ON 23 DEC 2006
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